WHAT IS CLAIMED IS;

1.   A motor controller comprising an AC motor, a power converter for applying a voltage to said AC motor by a PWM signal generated by comparing a command value with a carrier, and a controller for detecting a rotor position of said AC motor and controlling said command value, wherein:

said controller detects said rotor position on the basis of a difference between a real current differential vector and a reference current differential vector.

2.   A motor controller comprising an AC motor, a power converter for applying a voltage to said AC motor by a PWM signal generated by comparing a voltage command value with a carrier, and a controller for detecting a rotor position of said AC motor and controlling said voltage command value, wherein:

said controller has a first phase current detection unit for detecting respective current differentials changed by respective voltage vectors applied in a plurality of sections, a reference phase current differential calculation unit for calculating reference phase current differentials obtained by said plurality of voltage vector differences, and a position detection unit for detecting said rotor position of said AC motor using said current differentials and said reference phase current differentials.

3.   A motor controller comprising an AC motor, a power converter for applying a voltage to said AC motor by a PWM

signal generated by comparing a voltage command value with a carrier, and a controller for detecting a rotor position of said AC motor and controlling said voltage command value, wherein:

5   said controller has a current detection unit for detecting a current of said AC motor in synchronization with said carrier, a detection phase decision unit for calculating a detection position decided by said voltage and said detected rotor position, and a position detection unit for detecting said rotor position by using a component of said detection phase of said current vector.

    4.   A motor controller comprising an AC motor, a power converter for applying a voltage to said AC motor by a PWM signal generated by comparing a voltage command value with a carrier, and a controller for detecting a rotor position of said AC motor and controlling said voltage command value, wherein:

    said controller has a current detection unit for detecting respective current differential vectors changed by respective voltage vectors applied in a plurality of sections, a reference current differential vector calculation unit for calculating reference current differential vectors obtained by said plurality of voltage vector differences, and a position detection unit for detecting said rotor position of said AC motor using differences between said current differential vectors and said reference current differential vectors.

5.   A motor controller comprising an AC motor, a power converter for applying a voltage to said AC motor by a PWM signal generated by comparing a voltage command value with a carrier, and a controller for detecting a rotor position of said AC motor and controlling said voltage command value, wherein:

said controller has a current detection unit for detecting a current of said AC motor at a point of time when said carrier reaches close to a center value and a position detection unit for detecting said rotor position of said AC motor using said detected current.

6.   A motor controller according to Claim 2, wherein said first phase current detection unit has a function for removing a DC component.

7.   A motor controller according to Claim 2, wherein said controller has a second phase current detection unit for detecting phase currents of two phases unlike said first phase current detection unit.

8.   A motor controller according to Claim 7, wherein said controller has an error detection unit for detecting an error in said phase current detection units on the basis of AC components of said phase currents detected by said first and second phase current detection units.

9.   A motor controller according to Claim 3, wherein said current detection unit detects a current at a point of time when said carrier reaches close to a center value.

10.   A motor controller according to Claim 3, wherein said controller has a reference current vector calculation unit for calculating a detection phase component of a reference current vector for said voltage and detects said rotor position on the basis of said detection phase component of said reference current vector and said detection phase component of said current vector.

11.   A motor controller according to Claim 4, wherein said current detection unit detects currents at a plurality of points of time when said carrier reaches close to a center value and obtains said current differential vectors on the basis of said plurality of currents.

12.   A motor controller according to Claim 4, wherein in said controller, a detection phase decision unit for calculating a detection phase decided by said voltage and said detected rotor position has a position detection unit for detecting said rotor position using detection phase components of said differences of said current differential vectors and detection phase components of said reference current differential vectors.

13.   A motor controller according to Claim 5, wherein said controller has a detection phase decision unit for calculating a detection phase decided by said voltage and said detected rotor position and a position detection unit for detecting said rotor position using a detection phase component of a current vector.

14.   A motor controller according to one of Claims 3, 9, 11, 12, and 13, wherein said controller has a detection phase changing unit for changing said detection phase by adding a zero-phase voltage to said voltage.

15.   A motor controller according to Claim 3 or 4, wherein said controller switches current detection timing according to a motor speed.

16.   A motor controller according to Claim 15, wherein said current detection timing is a point of time when said carrier reaches a maximum value or a minimum value when said motor speed is low and a point of time when said carrier reaches close to a center value when said motor speed is high.

17.   A motor controller comprising an AC motor, a power converter for applying a voltage to said AC motor by a PWM signal generated by comparing a command value with a carrier, and a controller for detecting a rotor position of said AC motor and controlling said command value, wherein:

said controller has a calculation unit for deciding a detection voltage to be added to said command value on the basis of said detected rotor position and deciding a reference current variation which is a standard for current changes, a first phase current detection unit for detecting a current variation for said detection voltage, and a position detection unit for detecting said rotor position of said AC motor on the basis of said reference current variation and said current variation.

18.   A motor controller comprising an AC motor, a power converter for applying a voltage to said AC motor by a PWM signal generated by comparing a command value with a carrier, and a controller for detecting a rotor position of said AC motor and controlling said command value, wherein:

said controller has a phase current detection unit for detecting a current variation for said command value and a position detection unit for detecting said rotor position of said AC motor on the basis of a one-phase current variation.